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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/535,375

Filing Date: May 19, 2005

Appellant(s): MAHLING ET AL.

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Shao-Hua Guo  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed October 26, 2009 appealing from the Office action mailed June 4, 2009.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

4,372,758	Bobst et al	02-1983
6,492,298	Sobukawa et al	12-2002

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-12, 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bobst et al (4,372,758) in view of either Sobukawa et al (6,492,298)).

Bobst '758 discloses a process for removing unpolymerized gaseous monomers from a solid olefin polymer containing said gaseous monomers which comprises:

conveying said polymer to a purge vessel in a first gas stream, said gas being inert to said polymer and monomers and containing substantially no oxygen;

feeding a purge gas to said purge vessel, said purge gas being inert to said resin and said monomers and containing substantially no oxygen;

countercurrently contacting said polymer and said purge gas in said purge vessel to produce a second gas stream containing said purge gas, said conveying gas and said gaseous monomers and a polymer stream having a reduced amount of said gaseous monomers; and

recycling a portion of said second gas stream to said purge vessel (note claim 1).

The monomers to be removed can be ethylene, one or more of the hydrocarbon comonomers, saturated hydrocarbons and non-reactive hydrocarbon olefins (note column 3, lines 38-45). It would have been obvious to one skilled in the art to use the process of Bobst '758 to remove any gaseous monomers from any polymer (in solid or other forms) as long as the gaseous monomers contained in the polymer can be diffused out into and being removed by the gas purge stream.

The purge gas is preferred to be nitrogen (note claim 5).

After removing the second gas stream from the purge vessel, a portion of second gas stream is vented to a flare and the remaining is recycled back as the first gas stream (note Figure 1) or as the purge gas (note Figure 2).

Bobst '758 further discloses that the maximum permissible oxygen content varies depending upon the particular hydrocarbon monomer gas being stripped. As the concentration of the hydrocarbons increases in the presence of oxygen, the danger of explosion also increases, and this level varies with different hydrocarbons. Ideally, there should be no oxygen in the purge gas although a small amount can be tolerated depending upon the hydrocarbon concentration in purge vessel and the monomers being stripped. Those skilled in the art can easily determine the tolerable oxygen levels given a particular monomer (note column 4, line 64 to column 5, line 2).

Bobst '758 teaches that by employing relatively pure nitrogen as a purge gas, more hydrocarbon gases can be stripped from the resin particles and any pure nitrogen that may be discharged with the existing resins does not contribute to atmosphere

emissions as would gases containing impurities. It is therefore preferred that the purge gas be pure nitrogen and accordingly the embodiment shown in Figure 1 is preferred over that of Figure 2. In the latter, the recycle purge gas stream contains some evolved monomers gases thus lowering the extent to which the monomers gas concentration in the resin can be reduced. When the resin particles are purged with pure nitrogen, not recycled nitrogen, the cost of the process would increase due to the higher amount of fresh nitrogen used as the purge gas.

As clearly shown in Figure 2, a portion of the second gas stream (stream 27) is sent to a flare (note stream 29) to remove the ethylene therefrom and any inert gas contained in this portion of the second gas stream was discharged into the atmosphere. The remaining portion of the second gas stream (stream 33) is recycled to the reactor 22, however, this portion of the second gas stream is not subjected to any step to remove the ethylene, therefore, and the amount of monomers gas concentration in the resin that can be purged out using this portion of the second gas stream is lowered.

In order to minimize the cost of fresh inert gas for the process of Bobst '758, it would have been obvious to one skilled in the art to maximize the recycled amount of the inert gas, i.e. nitrogen, by not discharging the inert gas through a flare and to remove ethylene from the recycled inert gas so that the amount of monomers gas concentration in the resin that can be purged out will not be lowered.

The difference is Bobst '758 does not disclose the step of treating the second gas stream by oxidizing the ethylene in the presence of oxygen and a catalyst before recycling it to the purge vessel.

Sobukawa '298 discloses an ordinary-temperature purifying catalyst comprising an oxide having an oxygen defect introduced by a reduction treatment and a noble metal loaded on the oxide (note claim 1). The noble metal can be platinum (note Example 29). The catalyst can decompose and remove ethylene in an ordinary temperature range (note column 4, lines 57-58) by contacting the catalyst with air (as an oxygen-containing gas) containing the ethylene (note claim 20).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to remove ethylene in the entire second gas stream in the process of Bobst '758 by using an ordinary temperature purifying catalyst as suggested by Sobukawa '298 because using such catalyst would save energy (as compared when a "flare" is used) and more of the inert gas in the second gas stream can be recycled (no inert gas is lost in the "flare" and the recycled stream would contain less ethylene) thereby saving the cost of fresh inert gas.

For the combined teaching of Bobst '758 and Sobukawa '298, the recycled inert stream is desired to have low level of oxygen to avoid the danger of explosion as clearly taught in Bobst '758 and air is required when using the ordinary temperature purifying catalyst to remove the ethylene as taught '758, thus, to satisfy both requirements, it would have been obvious to one skilled in the art to optimize the amount of air used in order to sufficiently remove all the ethylene while minimizing the oxygen concentration in the resulting gas after the ethylene removal step. It would also have been obvious to one of ordinary skill in the art to optimize the amount of recycled inert gas as the

purging gas in the process of Bobst '758 based on the tolerable level of oxygen in the purging gas so that it would not cause any safety problem.

#### **(10) Response to Argument**

Appellants argue that Bobst '758 does not disclose the steps g) - j) as mentioned on page 4 of Appellants' brief.

Bobst '758 is not relied to teach steps g) - h). As stated in the above rejection, Sobukawa '298 is applied to teach the step of contacting a gas stream containing ethylene with air (oxygen-containing gas) and a catalyst at ordinary temperature to remove ethylene (same as the claimed steps g) - h)). Bobst '758 fairly teaches that a portion of the inert gas is desired to be recycled back to the process (note stream 33 in Figure 2) (same as the claimed step i)) and the combined teaching of Bobst '758 and Sobukawa '298 fairly suggests the step of keeping the oxygen level in the recycled inert gas stream to below explosion level, depending on the concentration of the hydrocarbon in the purge level (same as the claimed step j)) (note the reasons as stated in the above rejection). In response to appellant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Appellants argue that there is no suggestion in Bobst '758 to improve the process by eliminating its step f) while adding steps g) through j).

In Bobst '758, the ethylene in the second gas stream is removed by feeding a portion of the second gas stream to a flare (i.e. by burning). This step requires high temperature and any inert gas contained in that portion is lost. It would have been obvious to one of ordinary skill in the art to find alternative method to remove the ethylene of the second stream in the process of Bobst '758 without requiring high temperature and without loosing the inert gas, such as by using the process of Sobukawa '298.

Appellants argue that there is no indication in Sobukawa that its specific catalyst could be used for removing "unpolymerized gaseous monomers" from solid olefin polymers.

The "unpolymerized gaseous monomers" can be ethylene (note Appellants' specification, page 1, lines 20-25 and Bobst '758, column 3, line 38-42) and the catalyst of Sobukawa can be used to remove ethylene (note Example 29).

Appellants argue that a person of ordinary skill in the art would find no reason to use the catalyst of Sobukawa in the process of Bobst, which relates to a process for removing unpolymerized gaseous monomers from solid olefin polymers in a purge vessel.

Granted that Bobst '758 is related to a process for removing unpolymerized gaseous monomers from solid olefin polymers as argued by Appellants', however, after the monomers (including ethylene) are removed by using an inert gas stream (20, 33

from Figures 1 and 2, respectively), Bobst '758 teaches the step of removing at least some of the monomers from the resulting gas stream (12, 27) in order to recycle the remaining inert-containing gas stream (18, 33) back to the purge vessel. In Bobst '758, the monomers are removed by burning, i.e. feeding a portion of stream (12, 27) to a flare. It would have been obvious to one skilled in the art to use the process as suggested by Sobukawa '298 to remove ethylene, i.e. a monomer, at room temperature to save energy cost.

In response to Appellants' argument that Sobukawa '298 is nonanalogous art, it has been held that a prior art reference must either be in the field of Appellant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the Appellant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). Also, "Under the correct analysis, any need or problem known in the field of endeavor at the time of the invention and addressed by the patent [or application at issue] can provide a reason for combining the elements in the manner claimed." KSR International Co. v. Teleflex Inc., 550 U.S. \_\_\_, \_\_\_, 82 USPQ2d 1385, 1397 (2007). Thus a reference in a field different from that of Appellant's endeavor may be reasonably pertinent if it is one which, because of the matter with which it deals, logically would have commanded itself to an inventor's attention in considering his or her invention as a whole. In this case, both Bobst '758 and Sobukawa '298 are dealing with a process for removing ethylene from a gas stream. Regardless of how or where an inert gas stream containing ethylene was produced, one of ordinary skill in the art

would have reasonable expectation of success to remove ethylene from such gas stream by using the process of Sobukawa '298 because such gas stream has the same composition as the gas stream treated in Sobukawa '298 (note Example 29).

Appellants argue that there is no hint that such a modification (including adding oxygen) will result in an especially safe and inexpensive way of removing residual monomers from polymer particles.

As clearly disclosed in Bobst '758, as long as the level of oxygen in the purging gas is kept at a tolerable level (note column 6, line 58 to column 7, line 2), there would be no safety problem.

In response to Appellant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the Appellant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

#### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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